

What is claimed is:

1. A method for generating a carrier residual signal,  
comprising:

5 causing a light wave having a specific wavelength to  
enter into an optical modulating unit including an SSB  
optical modulator;

causing to be included in a light wave emitted from the  
optical modulating unit a carrier component related to a  
10 zero-order Bessel function and a specific signal component  
related to a specific high-order Bessel function while  
suppressing signal components other than the specific signal  
component related to the specific high-order Bessel  
function; and

15 setting a ratio of optical intensity between the  
carrier component and the specific signal component  
substantially to 1.

2. The method for generating a carrier residual signal  
20 according to claim 1,

wherein the SSB optical modulator includes two sub-  
Mach-Zehnder type optical waveguides nested into branch  
waveguides of a main Mach-Zehnder type optical waveguide.

25 3. The method for generating a carrier residual signal

according to claim 2,

wherein an optical modulation phase or intensity in the two sub-Mach-Zehnder type optical waveguides or the main Mach-Zehnder type optical waveguide that constitute the SSB optical modulator is adjusted.

4. The method for generating a carrier residual signal according to claim 1,

wherein the optical modulating unit multiplexes a portion of a light wave inputted to the SSB optical modulator or another light wave having the same wavelength as the light wave with a light wave outputted by the SSB optical modulator.

5. A device for generating a carrier residual signal comprising:

an optical modulating unit that includes a light source generating a light wave having a specific wavelength, and an SSB optical modulator,

wherein a light wave emitted from the light source enters into the optical modulating unit,

a light wave emitted from the optical modulating unit includes a carrier component related to a zero-order Bessel function and a specific signal component related to a specific high-order Bessel function while suppressing signal

components other than the specific signal component related to the specific high-order Bessel function, and

a ratio of optical intensity between the carrier component and the specific signal component is set  
5 substantially to 1.

6. The device for generating a carrier residual signal according to claim 5,

wherein the SSB optical modulator includes two sub-  
10 Mach-Zehnder type optical waveguides nested into branch waveguides of a main Mach-Zehnder type optical waveguide.

7. The device for generating a carrier residual signal according to claim 6,

15 wherein a film is formed on the two sub-Mach-Zehnder type optical waveguides or the main Mach-Zehnder type optical waveguide that constitute the SSB optical modulator or a portion of the film is removed.

20 8. The device for generating a carrier residual signal according to claim 6,

wherein the two sub-Mach-Zehnder type optical waveguides or the main Mach-Zehnder type optical waveguide that constitute the SSB optical modulator includes a portion  
25 having a structure in which arrangement between two branch

waveguides in each Mach-Zehnder type optical waveguide and electrodes for applying a modulation electric field or a direct current bias electric field to the branch waveguides is asymmetrical to the two branch waveguides.

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9. The device for generating a carrier residual signal according to claim 6,

wherein the two sub-Mach-Zehnder type optical waveguides or the main Mach-Zehnder type optical waveguide  
10 that constitute the SSB optical modulator includes electrodes for applying a modulation electric field or a direct current bias electric field to two branch waveguides in each Mach-Zehnder type optical waveguide, and adjusting electrodes for adjusting the electric field applied to the  
15 branch waveguides.

10. The device for generating a carrier residual signal according to any one of claims 5 to 9,

wherein the optical modulating unit includes a bypass  
20 optical waveguide that connects the SSB optical modulator with an input unit and an output unit of the SSB optical modulator.

11. The device for generating a carrier residual  
25 signal according to claim 10,

wherein the SSB optical modulator and the bypass optical waveguide are formed on the same substrate.

12. The device for generating a carrier residual  
5 signal according to claim 10 or 11,

wherein an optical intensity adjusting unit, which adjusts intensity of a light wave propagating through the bypass optical waveguide, is disposed in a middle of the bypass optical waveguide.

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13. The device for generating a carrier residual signal according to any one of claims 5 to 9,

wherein the optical modulating unit multiplexes a light wave inputted to the SSB optical modulator with a light wave  
15 of another light source having the same wavelength as the light wave in an output unit of the SSB optical modulator.